11/17/17 "The catching ends the pleasure of the chase" - Abraham Lincoln

HW: "Quadratic Formula" w/s #6, 7, 8, 9, 10

AIM: How do we solve quadratic equations that are not factorable?

Warm Up:

1) The answers to a quadratic equation are called:

(1) roots (3) solutions

(2) zeroes (4) all of the above

HW: check:

3) $v^2 - 14v - 44 = 0$

$v^2 - 14v + \boxed{49} = 44 + \boxed{49}$

$\frac{-14}{2} = -7$

$(-7)^2 = 49$

$\pm\sqrt{(v-7)^2} = \pm\sqrt{93}$

$v - 7 = \pm\sqrt{93}$

$+7 \quad +7$

$v = 7 \pm \sqrt{93}$

$v = 7 + \sqrt{93}$

$v = 7 - \sqrt{93}$

7) $n^2 - 4n + 57 = -5$

$-57 \quad -57$

$n^2 - 4n + \boxed{4} = -62 + \boxed{4}$

$\frac{-4}{2} = -2$ $\quad (n-2)(n-2)$

$(-2) = 4$

$\pm\sqrt{(n-2)^2} = \pm\sqrt{-58}$

$n - 2 = \pm\sqrt{-58}$

$+2 \quad +2$

$n = 2 \pm \sqrt{-58}$

$n = 2 \pm i\sqrt{58}$

Quadratic equations have just one unknown, but contain a square term as well as linear terms.
For example, $2x^2 + x = 3$ is a quadratic equation in x
$7t = 5t^2 + 1$ is a quadratic equation in t.

There is a formula for finding the unknown value, but before it can be used the equation must be written with all of its terms at one side of the equation i.e. in the form $ax^2 + bx + c = 0$ where a, b and c are known positive or negative numbers and x is the unknown value.

The Quadratic Formula

The solutions of the equation $ax^2 + bx + c = 0$ are:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Example 1 Solve the equation $2x^2 + x = 3$

How to do it...

Rearrange the equation so all terms are at one side:

$2x^2 + x = 3$
$-3 \quad -3$

$\rightarrow 2x^2 + x - 3 = 0$

Write down the values of *a*, *b* and *c*:

$a = 2 \quad b = 1 \quad c = -3$

Substitute these values into the formula:

$$x = \frac{-1 \pm \sqrt{(1)^2 - 4(2)(-3)}}{2(2)}$$

Work out the values in the square root and denominator first:

$$x = \frac{-1 \pm \sqrt{25}}{4}$$

Take the square root :

$$\frac{-1 \pm 5}{4}$$

Split the formula into two, using + in one and – in the other:

$$\frac{-1+5}{4} = \frac{4}{4} = 1 \qquad \frac{-1-5}{4} = \frac{-6}{4} = -\frac{3}{2}$$

Work out the answers:

Now Try this one on your own:

Solve for all values of *x*

$$x^2 + 4x = -5$$